United States Department of Agriculture

Animal and Plant Health Inspection Service

Program Aid No. 600

Foot-and-Mouth Disease:

A Foreign Threat to U.S. Livestock

The Threat of Foot-and-Mouth Disease

Foot-and-mouth disease (FMD) is a highly contagious viral disease that can affect domestic cloven-hoofed animals (cattle, swine, sheep, and goats) and many wild animals (deer, bison, pronghorn antelope, and feral swine). It is not a health risk for humans, and it does not affect dogs, cats, or horses.

This country has been free of FMD since 1929, when the last of nine U.S. outbreaks was eradicated.

The disease is characterized by fever, blister-like lesions, and ulcers on the surfaces of the mouth, tongue, nostrils, muzzle, feet, and teats. Many affected animals recover, but the disease leaves them debilitated, causing losses in the production of meat and milk. Animals do not normally regain lost weight for many months.

FMD spreads widely and rapidly and has significant economic and physical consequences. It is one of the animal diseases livestock owners dread most. As a result of the 2001 outbreak in Great Britain, some 6 million animals were culled, and financial losses were in the billions.

What Causes FMD?

The disease is caused by a virus that can remain viable for long periods of time in carcasses, animal byproducts, water, straw and bedding, and even in pastures. There are

Excessive salivation and smacking of the lips are early signs of FMD.

at least 7 separate types and more than 60 subtypes of FMD virus. Animals can be affected by one or more of these types at the same time.

Recovered animals can suffer repeated attacks of the disease because immunity to one type of FMD virus does not protect an animal against the other types.

Signs of FMD

Signs of illness can appear after an incubation period of 1 to 8 days, but often develop within 3 days. Vesicles (blisters) in the mouth, on the tongue and lips, on the teats, or between the toes—and the resulting excessive salivation or lameness—are the best known signs of the disease. Often, blisters may not be observed because they rupture easily, leaving erosions.

The following signs may appear in affected animals during an FMD outbreak:

- Marked rise in body temperature for 2 to 3 days
- Vesicles that rupture and discharge clear or cloudy fluid, leaving raw, eroded areas surrounded by ragged fragments of loose tissue
- Production of sticky, foamy, stringy saliva
- Reduced consumption of feed due to painful tongue and mouth lesions
- Lameness with reluctance to move
- Abortions
- Low milk production in dairy cows
- Myocarditis (inflammation of the muscular walls of the heart) and death, especially in newborn animals

Confusion With Other Diseases

FMD can be confused with several similar but less harmful diseases (i.e., vesicular stomatitis, bovine viral diarrhea, and swine vesicular disease) because the signs are similar. Whenever blisters or other typical signs are observed and reported, laboratory tests must be conducted to determine whether the disease is FMD.

How It Spreads

FMD is considered the most contagious livestock disease. All secretions, excretions, and tissues are contagious, and the virus may be present in breath, milk, or semen 2 days before the appearance of clinical signs of illness. The virus enters a susceptible animal either orally (swine) or via the respiratory tract (cattle).

Recently ruptured vesicle (blister) above the dental pad.

Ruptured vesicle producing erosive lesion of the gum.

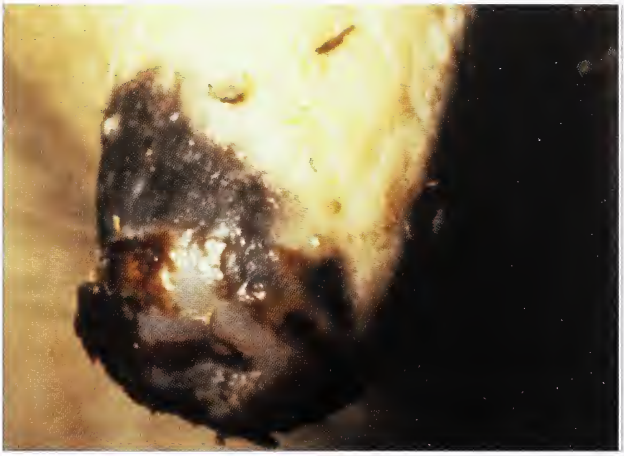
Ruptured vesicle on the dental pad.

Tongue vesicles that have ruptured and begun to slough.

Newly formed vesicle (small white area) on a hog's snout.

A ruptured vesicle with blanching of tissue in the interdigital space.

Unruptured teat lesion on a cow.



Ruptured teat lesion with necrosis.

Airborne transmission can be a major means of spread among animals in close proximity on the same premises. Infectious particles can also be aerosolized from bulk milk trucks and spread to animals on other premises. The virus can survive in the human respiratory tract for up to 24 hours. This allows people in close contact with infected animals to serve as a source of virus exposure for other animals. High humidity and moderate temperatures can allow airborne spread from premises to premises. The disease can also be transmitted by contaminated objects, artificial insemination, contaminated vaccines or other biologicals, and feeding contaminated garbage to animals.

Where Does FMD Occur?

The disease is widespread. Various types of FMD virus have been identified in Africa, South America, Asia, and some parts of Europe. North America, Central America,

Australia, New Zealand, Japan, Chile, and many countries in Europe are considered free of FMD because governments there have conducted effective programs to prevent its introduction or to eradicate it.

Potential Impacts

FMD is one of the most difficult animal infections to control. Because the disease occurs in many parts of the world, there is always a chance of accidental or deliberate introduction into the United States.

Animals in this country are highly susceptible to FMD. If an outbreak were to occur in the United States, this disease could spread rapidly to all sections of the country by routine livestock movements unless detected early and eradicated immediately. If FMD were to spread unchecked, the economic impact could reach billions of dollars in the first year from trade restrictions, eradication and surveillance costs, loss of consumer confidence, and higher food costs. The nation's deer and other susceptible wildlife populations could also become infected and potentially re-infect livestock.

Prevention and Control

The United States has strict import regulations in place that prohibit the entry of animals and animal byproducts from FMD-affected countries and regions. A single infected animal or one contaminated meat product could carry the virus to American livestock. USDA works closely with the U.S. Department of Homeland Security's Customs and Border Protection are kept out of our country. To further protect against an FMD introduction, USDA also cooperates with its international partners to support other countries in their FMD prevention and control efforts.

In addition, USDA keeps pace with the latest science regarding FMD vaccines. At this time, there is no universal FMD vaccine that protects against all of the serotypes and subtypes of the disease. The currently available FMD vaccines must be matched to the specific type and subtype of virus causing the outbreak. USDA has access to these vaccines through the North American Foot-and-Mouth Disease Vaccine Bank. Depending on the situation, FMD vaccination can help contain the disease if it is used strategically—during an active outbreak—to create barriers between FMD-infected zones and disease-free areas. However, USDA's first response to an FMD outbreak in the United States would be one of "stamping out"—imposing animal movement restrictions and eradicating the disease immediately.

What You Can Do

There are many ways you can support our Nation's efforts against FMD:

- **Check your animals.** Watch for excessive salivation, lameness, and other signs of FMD in your herd.
- **Immediately report any unusual or suspicious signs of disease to your veterinarian, to State or Federal animal disease-control officials, or to your county agricultural agent.** If FMD should appear in your animals, your report will rapidly set in motion an effective State and Federal eradication program.
- **Routinely practice biosecurity to prevent diseases from being introduced to your herd.** For example, isolate new animals for at least 2 weeks, and wash and disinfect your boots/shoes and clothing if you have been on another farm.
- **Register your premises and identify your animals with National Animal Identication System (NAIS)–compliant 840 devices.** In a disease outbreak, animals that are part of NAIS can be rapidly traced, and traceability is the key to animal disease protection. NAIS helps producers and animal health officials respond quickly and effectively to animal health events in the United States.

Your assistance is vital. Recognizing the early signs of disease and promptly notifying officials are essential for eradication to be successful. Your warning may prevent FMD from becoming established in the United States, or—if it does spread—reduce the time and money needed to wipe it out. You can find more FMD information on the Internet at www.aphis.usda.gov/newsroom/hot_issues/fmd/fmd.shtml.

To learn more about FMD or other foreign animal diseases, contact your local veterinarian, your county extension agent (see www.csrees.usda.gov/Extension/index.html), or State or Federal animal health officials (see www.aphis.usda.gov/animal_health/area_offices/).

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